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101ST CONGRESS
1st Session

SENATE

REPORT
101-52

RENEWABLE ENERGY/FUEL CELL INTEGRATION ACT OF 1989

JUNE 5 (legislative day, JANUARY 3), 1989.—Ordered to be printed

Mr. JOHNSTON, from the Committee on Energy and Natural Resources, submitted the following

REPORT

[To accompany S. 633]

The Committee on Energy and Natural Resources to which was referred the bill (S. 633), to promote the development of technologies which will enable fuel cells to use alternative fuel sources, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass.

PURPOSE OF MEASURE

The purpose of the bill, as reported by the Committee, is to promote the development of technologies which will enable fuel cells to use alternative fuel sources.

SUMMARY OF MAJOR PROVISIONS

S. 633 as reported by the Committee is intended to encourage research on technologies that will enable fuel cells to use alternative fuel sources such as methane from biomass, wind energy, and solar energy. The bill directs the Secretary of Energy to implement and carry out a research program and authorizes the Secretary of energy to make grants to, or contract with private research laboratories, subject to appropriations, for that purpose. The Secretary is directed to transmit to Congress by September 30, 1992, a comprehensive report on the research carried out under this legislation. The bill also authorizes $5 million for fiscal year 1990 for conducting this research.

S313-9

BACKGROUND AND NEED

In 1985, the Congressional Research Service issued a report entitled, "Fuel Cells for Electric Power Production: Future Potential, Federal Role and Policy Options" (85–523 SPR). This report explained that the goal of Federal research in fuel cells since the mid-1970's has been to develop a highly energy efficient technology with especially desirable characteristics for electric power production. These characteristics include high performance, fuel flexibility, low environmental impact, small size and spinning reserve capability. The primary national gains expected from this research are increased fuel use efficiency, substitution of alternate fuels for conventional fuels, and the potential for improving our national balance of trade through the export of fuel cell technology.

The Federal investment in fuel cell technology research and development since 1975 has been approximately $300 million. This research and development program has been built largely upon Congressional initiatives. The CRS report noted that the point of commercial payoff for this large investment appears to be fast approaching, but a strategy and policy for acting upon the research findings has not yet been implemented. This bill is aimed at achieving such a policy change by encouraging the development of fuel cells integrated with renewable energy resources.

The fuel cell, an electro-chemical device first constructed by Sir William Grove in 1839, had its first practical application in the Gemini V flight of August 1965, where it proved to be an efficient, reliable power generator with very high-energy density. Fuel cells operate by combining hydrogen-rich gas with air and converting the chemical energy directly into electricity without any intermediate combustion step. This contributes to its high efficiency rate of 40 to 60 percent. In addition, the heat generated is sufficient to permit cogeneration space heating, for an overall efficiency rate as high as 80 percent. A typical cell produces high, direct current in a low voltage. Practical voltages are obtained by connecting many individual cells into what is referred to as a cell stack.

Besides their high efficiencies, fuel cells offer a number of other advantages, including economy and size. They can be factory assembled, leading to short construction lead times and put on line in relatively short periods of time. The capital outlay and interest costs for fuel cell technologies are expected to compare favorably with other power generation technologies. In addition, their modular design means that output can be increased incrementally, which allows for a closer match between capacity and anticipated demand growth. Hence this technology holds promise for both centralized and decentralized power systems, including hybrid applications with renewable systems.

LEGISLATIVE HISTORY

S. 633 was introduced on March 16, 1989, by Senator Matsunaga for himself, and Senators Murkowski, Bingaman, Inouye, Wirth, Pell, and Lieberman. Senators Boschwitz and Sanford were added as co-sponsors on April 11, 1989. The bill was referred to the Committee. No legislative hearings were held by the Committee during the 101st Congress. However, on September 23, 1987, the Subcom-

mittee on Energy Research and Development held a legislative hearing on an identical bill (S. 1294). S. 1294 was reported formally by the Committee (S. Rpt. 100-457) on August 5, 1988 and approved by the Senate on August 8, 1988.

COMMITTEE RECOMMENDATION AND TABULATION OF VOTES

The Committee met in open business to consider S: 633 on June 7, 1989. The Committee, with a quorum present, recommended that the Senate pass S. 633. The roll call vote on the reporting of the measure was 18-0.

YEAS	NAYS
Mr. Johnston	
Mr. Bumpers [1]	
Mr. Ford	
Mr. Bradley	
Mr. Bingaman [1]	
Mr. Wirth [1]	
Mr. Conrad	
Mr. Heflin	
Mr. Rockefeller	
Mr. McClure	
Mr. Hatfield	
Mr. Domenici	
Mr. Wallop	
Mr. Murkowski	
Mr. Nickles	
Mr. Burns	
Mr. Garn [1]	
Mr. McConnell	

[1] Indicates vote by proxy.

SECTION-BY-SECTION ANALYSIS

Section 3 directs the Secretary of Energy to implement and carry out a research program on technologies that will enable fuel cells to use alternative fuel sources, and authorizes the Secretary to make grants to, or contract, subject to appropriations, with private research laboratories for that purpose.

Section 4 directs the Secretary to transmit to Congress by September 30, 1992, a comprehensive report on the research carried out under this legislation.

Section 5 authorizes $5 million in fiscal year 1990 for conducting this research on technologies which enable fuel cells to use alternative fuel sources.

COST AND BUDGETARY CONSIDERATIONS

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, June 12, 1989.

Hon. J. BENNETT JOHNSTON, Jr.,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed S. 633, the Renewable Energy/Fuel Cells Systems Integration Act of 1989, as ordered reported by the Senate Committee on Energy and Natural Resources, June 7, 1989. CBO estimates that enacting S. 633 would increase federal outlays by $3 million in fiscal year 1990 and $2 million in fiscal year 1991, assuming appropriation of the authorized amount.

S. 633 would create a research program within the Department of Energy to develop fuel cell technologies that use alternative fuel sources such as biomass, wind, and solar energy. The proposed program would also explore possibilities for using fuel cells in conjunction with renewable power systems in rural and isolated areas. The bill authorizes the appropriation of $5 million for fiscal year 1990 for conducting the renewable energy/fuel cells research.

The bill would not have any effect on the budgets of state and local governments.

If you wish additional details on this estimate, we will be pleased to provide them. The CBO staff contact is Peter Fontaine, who can be reached at 226-2860.

Sincerely,

ROBERT D. REISCHAUER.
Director.

REGULATORY IMPACT EVALUATION

The bill is not a regulatory measure in the sense of imposing Government-established standards or significant economic responsibilities on private individuals and businesses. S. 633 as reported authorizes a research program to promote the development of fuel cells using renewable energy resources, authorizes the Secretary of Energy to make grants to our contract with private laboratories for the purpose of carrying out this research, directs the Secretary of Energy to submit a report on the research carried out pursuant to this Act.

No personal information would be collected in administering this program. Therefore, there would be no impact on personal privacy from S. 633.

EXECUTIVE COMMUNICATIONS

There were no communications received by the Committee from the Administration relating to S. 633.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the committee notes that no changes in existing law are made by the bill, S. 633, as reported.

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